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Different Types of Economies within the LBK Settlement Erkelenz-Kückhoven

Abstract: Around 5300 BC the first farmers (Linear Pottery Culture) reached the Rhineland. In the region of the Aldenhovener Platte, Rhineland, a complex system of raw material exchange was proposed by A. Zimmermann (1995) in which main settlements (distributors) passed on cores, blades and final products to secondary and single farmstead settlements (receivers). With reference to the Early Neolithic settlement Erkelenz-Kückhoven, this paper sets out to demonstrate that similar processes, resembling a "receiver/distributor-settlement"-pattern, actually occurred within individual settlements. It is likely that these resulted from different social units within the settlement. The results were obtained in the course of a MA-thesis at the University of Cologne in 2005.

Introduction

The Linear Pottery Culture settlement Erkelenz-Kückhoven, located approx. 40 km northwest of Cologne in the Rhenish Loess Börde *(Fig. 1)*, is well known for the unique find of a wonderfully preserved well. The settlement, which was occupied from approx. 5250 BC until the end of the Rhenish Linear Pottery Culture around 4925 BC, is located upon a plateau, without direct access to water resources such as lakes or rivers. Indeed, this remarkable geographical situation was almost certainly the reason for the construction of the aforementioned well. In addition, three settlement-ditches were identified within the settlement area (Lehmann 2004).

There is a long tradition, especially in the English literature, to investigate social differences within settlements (Bogucki / Grygiel 1993, 417–419; Milisauskas 1972, 72–73; Whittle 1996, 162–167; 171–174). The results presented in this paper show the social differences on the intra-site level of the settlement Erkelenz-Kückhoven. This is an idea which developed following on from the analysis of the LBK cemeteries Niedermerz 3 (Hoyer 2005) and Altdorf (Heller 2004), which both show a division in a north and a south area without any chronological explanation and can also be observed in both raw materials and artefacts.

The main question of this examination is whether there are similar differences in supply and / or economy within the settlement of Kückhoven. In a first step the settlement of Kückhoven was divided in two artificial halves based partly on archaeological and partly on arbitrary reasons, e.g. open versus built-up areas, houses within or outside of the settlement-ditches, and the orientation of the houses. Whereas the northwest section (designated in the following as the NW area) of the settlement covers an area of around 34,000 m^2 and contains 30 houses, the south-east part (designated in the following as the SE area) encompasses an area of around 47,000 m^2 and contains 72 houses *(Fig. 2)*.

The whole settlement was continuously inhabited for 13 phases (one phase corresponds to approx. 25 years; Stehli 1989, 61).The settlement activities in the NW area began one phase later than in the SE area. An arbitrary division was made for the phases of the settlement-ditches. The houses inside the ditches were assigned to the SE area and houses on the outside were assigned to the NW area.

Lithic artefacts were recorded following SAP guidelines (SAP = Projekt for Settlement Archaeology of the Aldenhovener Platte) which are the standard for data capture of Neolithic artefacts in western Germany. The statistical calculation (simple descriptive statistics) was done with SAS (Statistical Analysis System, SAS Institute Inc.). The results have been tested for significant differences between the two areas, e.g. the confidence intervals for parameters of binominal distributions were checked for significant differences (Ihm / Lüning / Zimmermann 1978, 292–300; Geigy 1980). In the following discussion, only the most important results, procedures and tables will be described. It will be shown that the somewhat arbitrary artificial division described previously actually separates two areas within the settlement, both of which display quite different

Fig. 1. Location of the settlement of Erkelenz-Kückhoven.

behaviour with respect to lithic raw materials and artefacts.

Results

Flint Raw Material

Flint raw materials were mainly Ryckholt- and Gravel-Flint *(Fig. 3)*. Ryckholt-Flint is an imported raw material of good quality, while Gravel-Flint outcrops occur locally and material is of inferior quality. Already at this point, significant differences between the two areas become noticeable (The result is statistically significant at the 1% level; Ihm / Lüning / Zimmermann 1978, 292–300; Geigy 1980). Whereas in the southeast area Ryckholt-Flint dominates, in the northwest Gravel-Flint is more strongly represented. This means that the people of the NW area lacked sufficient access to the "good" Ryckholt-Flint, and had to compensate with local "inferior" Gravel-Flint and flints of other origins.

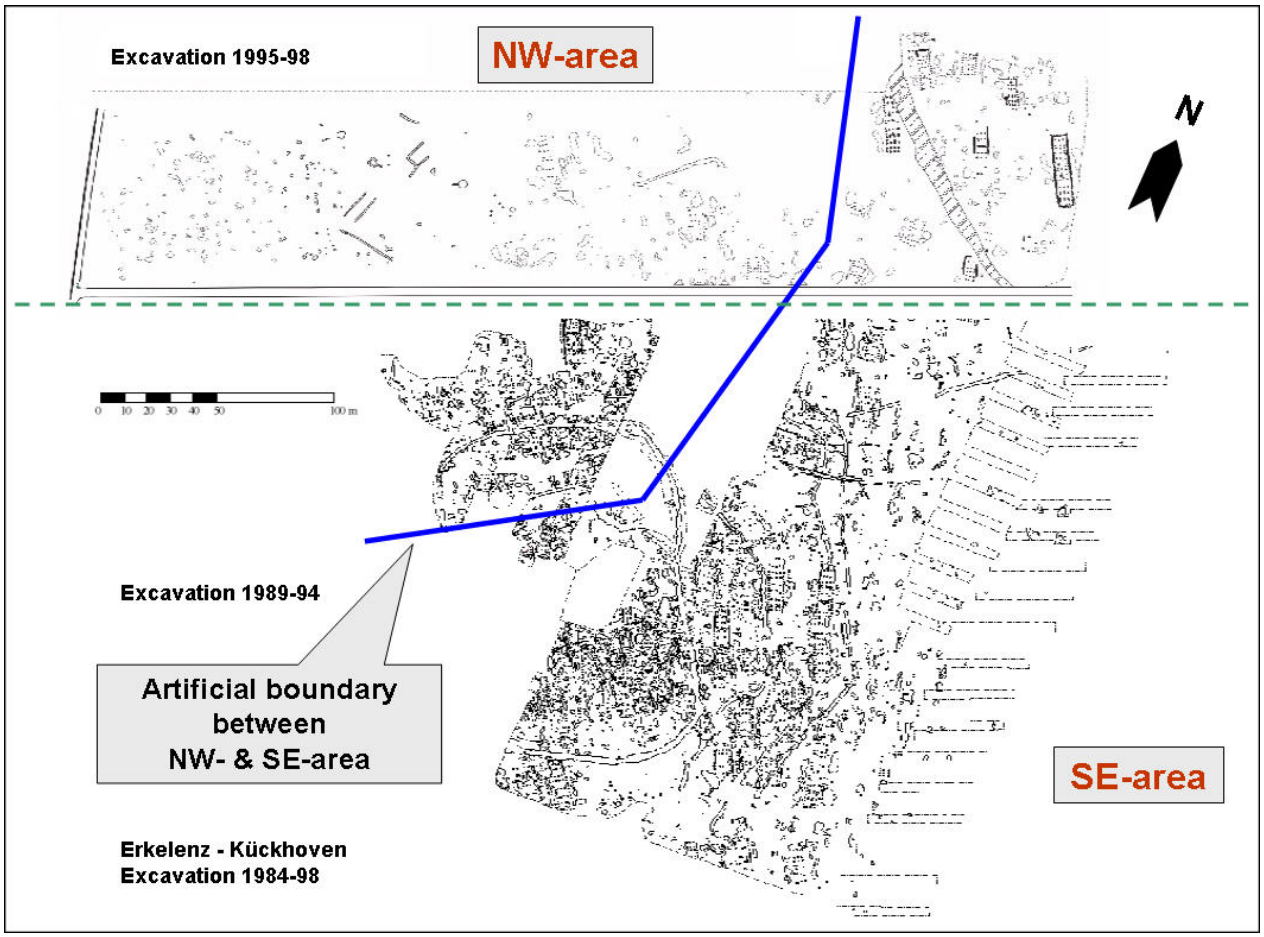

Fig. 2. Partitioning of the settlement Kückhoven. Plan according to Lehmann (2004) and Weiner (1997), partitioning by Nockemann (2005).

Main silex raw materials	NW-Area		SE-Area		Total	
	n	%	n	%	n	%
Ryckholt-Flint	508	71.0 %	1092	82.6 %	1600	78.5 %
Gravel-Flint	144	20.1 %	168	12.7 %	312	15.3 %
other Flints	63	8.9%	62	4.7 %	125	6.2 %

Fig. 3. Main silex raw materials.

Blank Types

According to the receiver/distributor-settlement model proposed by Zimmermann (1995, 92–96) settlements can be classified as "receivers" or "distributors"; this division is based on the flake/blade ratio of a site's lithic assemblage *(Fig. 4)*. While a dominance of flakes and the presence of only a few blades is indicative of a distributor settlement, fewer flakes and more blades are typical for a receiver. The differences between the ratios of the flakes and debris are highly significant for both areas. The result is statistically significant at the 1% level. The ratio of flakes to blades in the NW area is 1 : 1.88, and in the SE area 1 : 2.26. Thus, the ratio is smaller in the NW area of the settlement. Although blanks were produced in both parts of the settlement, in the NW area production was clearly less pronounced. This is also confirmed by twice the amount of debris from the northwest in comparison to the southeast (NW = 10.1%; SE = 4.9%); amounts which are related to the relative intensity of raw material exploitation *(Fig. 5)*.

Blank Fragments

Besides complete blades, medial blade fragments also represented a main production goal, as these were more suitable for tool production. Conversely, proximal blade fragments represent mainly production waste. Thus distributor settlements display a higher ratio of proximal blade fragments whereas in receiver settlements medial blade fragments are more common. The idea lying behind this hypothesis is that a producer settlement passes on a part of its products, thus resulting in a higher percentage of waste at these sites. Also in this regard clear differences can be observed in both areas of the Kückhoven settlement *(Fig. 6)*. Whereas the northwest area, together with Frimmersdorf 53 (Schulz 1991), is an obvious receiver settlement; the SE part of the site is found among the distributor settlements such as Langweiler 8 (Zimmermann 1988).

Metric Measurements of the Blanks and Blank Fragments

Metric values associated with blank production, e.g. arithmetic average value, median, curvature, standard deviation etc., make it possible to compare with other data the standardisation of production and the supply situation of a given settlement. The following tendencies were observed for the two areas at Kückhoven:

While the dispersion of the measurements relating to unmodified flakes is larger in the NW area, their respective median and average values are smaller. Thus, it could be concluded that it was more difficult for the inhabitants of the NW-part of the site to produce large and standardised flakes. This may also have resulted from the aforementioned problematic raw material supply. Furthermore, the modified flakes from the NW area also display a higher deviation of width and thickness; indeed, this may imply that the people in this part of the settlement had to work with a higher ratio of inhomogeneous blanks. Nevertheless, median and average values of modified flakes are still very similar, in both parts of the settlement, an indication that a certain standard in tool production still was upheld.

Also, the differences between the lengths of modified and unmodified blades show the same tendency; in the northwest area the difference amounts to

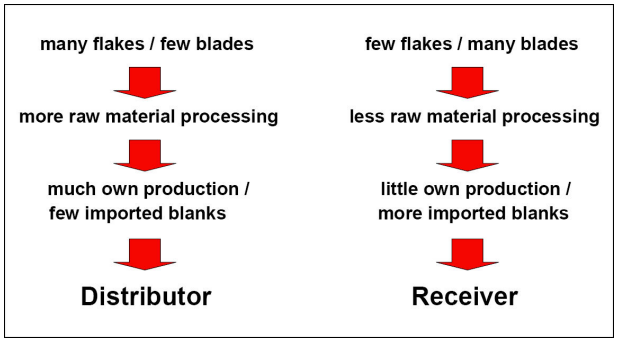

Fig. 4. Receiver/distributor-model after Zimmermann (1995).

Blank Types		Cores			Flakes			Blades			Debris			Row-
		unmod.	mod.	Sum	unmod.	mod.	Sum	unmod.	mod.	Sum	unmod.	mod.	Sum	sum
NW-Area	n	12	13	**25**	329	101	**430**	103	126	**229**	69	8	**77**	**761**
	%	*1,6*	*1,7*	***3,3***	*43,2*	*13,3*	***56,5***	*13,5*	*16,6*	***30,1***	*9,1*	*1,1*	***10,1***	***100***
SE-Area	n	22	23	**45**	664	224	**888**	173	220	**393**	58	11	**69**	**1395**
	%	*1,6*	*1,6*	***3,2***	*47,6*	*16,1*	***63,7***	*12,4*	*15,8*	***28,2***	*4,2*	*0,8*	***4,9***	***100***
Sum	n	34	36	**70**	993	325	**1318**	276	346	**622**	127	19	**146**	**2156**
	%	*1,6*	*1,7*	***3,2***	*46,1*	*15,1*	***61,1***	*12,8*	*16,0*	***28,8***	*5,9*	*0,9*	***6,8***	***100***

Fig. 5. Blank types.

5 mm while in the SE area it is only 1 mm. This implies that the southeast was well supplied; sufficient numbers of large pieces were available and not all large pieces had to be modified. On the other hand, in the NW area all pieces which exhibited merely the approximate required length were modified. This means that the supply to this area was insufficient and blades of sufficient length for tool production had to be imported.

Flint Tools

A comparison of the tool assemblages from both areas of the site provides some evidence with regard to both the emphasis placed upon particular activities, as well as to the supply situation of the different parts of the settlement. Due to the different number of households in both areas, tool ratios were set in relation to their number (the NW area

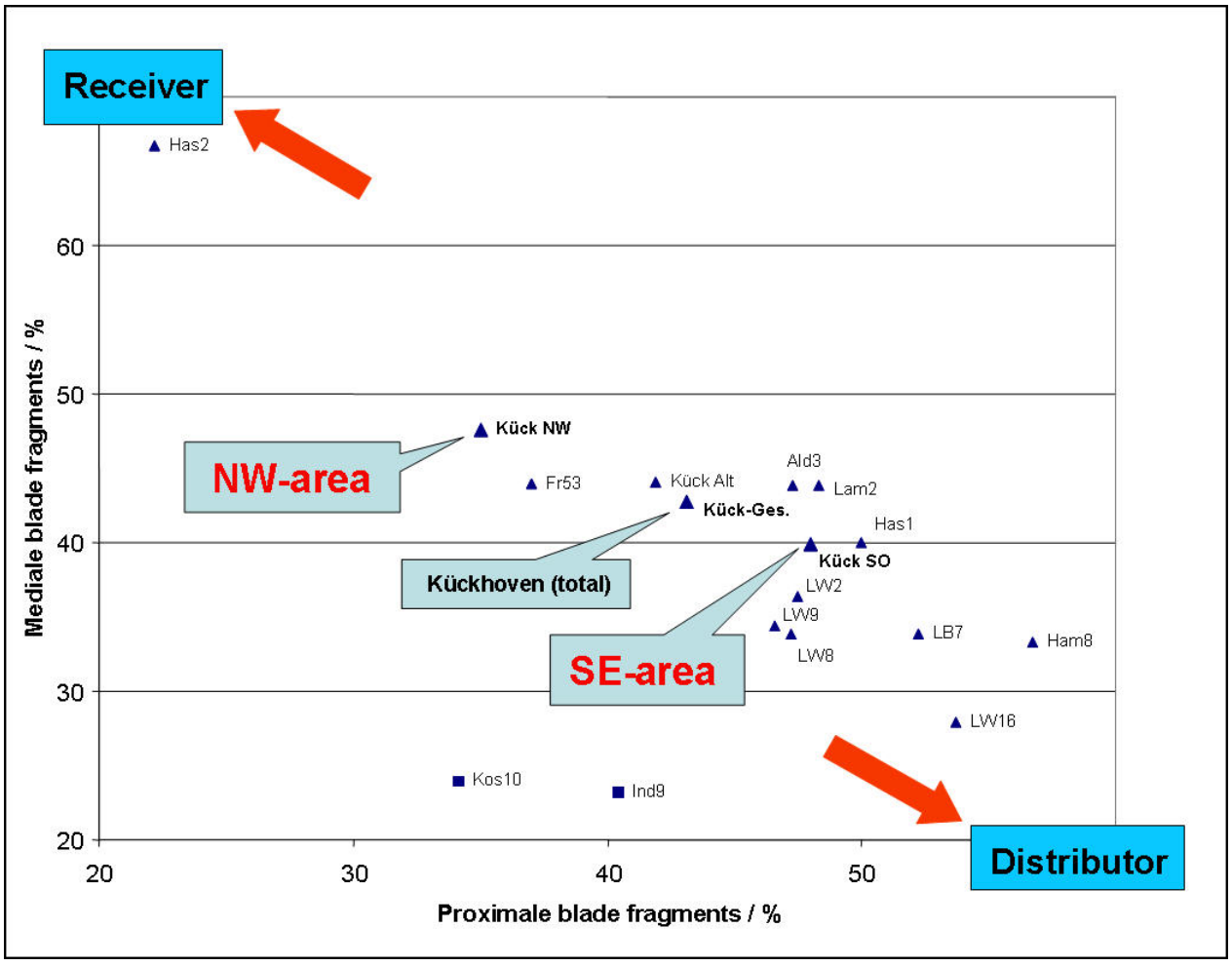

Fig. 6. Relative proportion of medial to proximal blade fragments.

Flint tools	NW-Area		SE-Area		Sum		Proportion
	n	%	n	%	n	%	NW / SE
Arrowheads	11	4,4	16	3,3	27	3,7	1:1.5
Borers	10	4	11	2,3	21	2,9	1:1.1
Sickle blades w. diagonal varnish	21	8,5	49	10,2	70	9,6	1:2
Sickle blades w. parallel varnish	13	5,2	40	8,3	53	7,3	1:3.1
Burins	3	1,2	6	1,2	9	1,2	1:2
Truncated pieces	38	15,3	70	14,6	108	14,8	1:2
Scrapers	61	24,6	119	24,7	180	24,7	1:2
Lateral retouched pieces	57	23	119	24,7	176	24,1	1:2
Splintered pieces	19	7,7	21	4,4	40	5,5	1:1.1
Flint Hammerstones	15	6	30	6,2	45	6,2	1:2
Sum	248	100	481	100	729	100	-

Fig. 7. Flint tool proportions.

with 30 houses, and the southeast area encompassing 72 houses); this results in a ratio NW to SE of 1 : 2.4. Therefore, a tool ratio of 1 : 2 means that the tool-frequencies are roughly the same in both areas, and a tool-ratio well under 2.4 means that a tool is more frequent in the northwestern part of the settlement. For blades with diagonal sickle gloss, burins, truncated pieces, scrapers, laterally retouched pieces and flint-hammerstones the ratio between northwestern and southeastern areas is 1 : 2 *(Fig. 7)*. This value corresponds quite well to the proportion of the houses, so these tools are represented almost equally in both parts of the settlement. In contrast, arrowheads (1 : 1.5), borers (1 : 1.1) and splintered pieces (1 : 1.1) occur more frequently in the northwest, while blades with edge-parallel sickle gloss (1 : 3.1) are more common in the southeastern-part of the site. Differences in the activities conducted in the two parts of the settlement now become visible.

Blank Types of Tools

Generally, blade blanks were preferred for tool production. In fact, in both areas only blade blanks appear to have been acceptable for the production of certain tools such as borers or sickle blades *(Fig. 8)*. On the other hand, for other tools, e.g. arrowheads, scrapers and truncated pieces, both blank-types were considered suitable. Whereas in the northwestern part of the settlement blade blanks outweigh for arrowheads, burins, truncated pieces and scrapers, probably owing to the poorer supply with raw material and the subsequent import of blade blanks, in the southeastern part of the site flakes could be manufactured in such size and quantity that they were also used for tool production.

Flint tools	NW-area						SE-area					
	Flakes		Blades		other Blanks		Flakes		Blades		other Blanks	
	%	n	%	n	%	n	%	n	%	n	%	n
Boerers	40	4	60	6			36,4	4	63,6	7		
Sickle blades w. diagonal varnish	14,3	3	85,7	18			14,3	7	85,7	42		
Sickle blades w. parallel varnish	15,4	2	84,6	11			17,5	7	82,5	33		
Arrowheads	36,4	4	63,6	7			87,5	14	12,5	2		
Burins	33,3	1	66,7	2			50	3	50	3		
Truncated pieces	44,7	17	52,6	20	2,6	1	57,1	40	42,9	30		
Scrapers	39,3	24	59	36	1,6	1	47,1	56	52,1	62	0,8	1
Lateral retouched pieces	56,1	32	40,4	23	3,5	2	65,5	78	33,6	40	0,8	1
Splintered pieces	63,2	12	15,8	3	21,1	4	71,4	15	4,8	1	23,8	5
Flint hammerstones	13,3	2			86,7	13					100	30
Total	40,7	101	50,8	126	8,5	21	46,6	224	45,7	220	7,7	37

Fig. 8. Tool blank types.

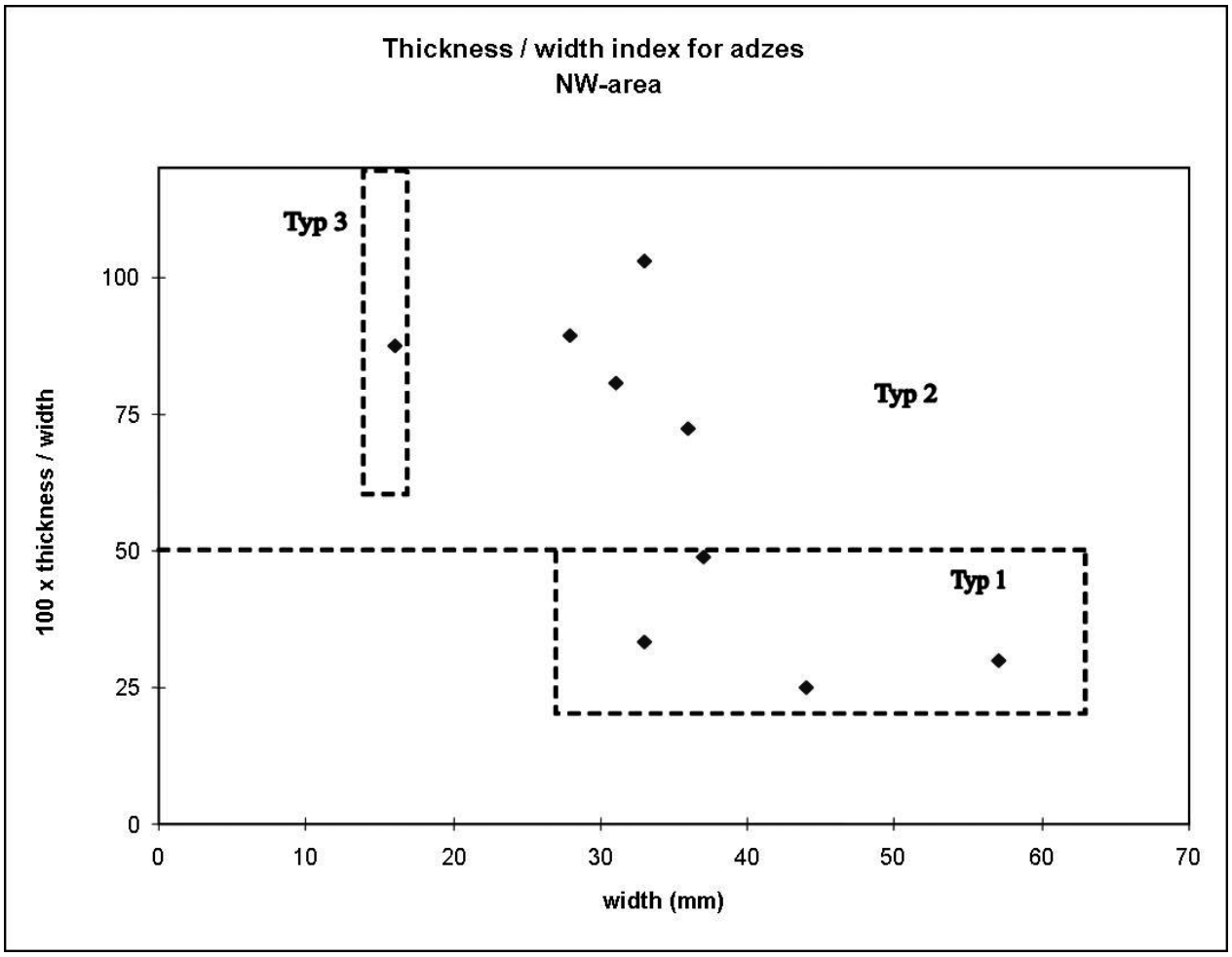

Fig. 9. Thickness / width index of adzes of the NW area.

Adzes

Adze-blades are more frequently found in the northwestern area (Ratio NW/SE = 1 : 1.5; NW = 17 pieces; SE = 26 pieces). Remarkably, polishing stones, required for production and sharpening and repair of adzes, are also more frequent (Ratio NW/SE = 1 : 1.3; NW = 10 pieces; SE = 13 pieces). Bakels (1987) developed a typology of adze-types using a thickness/width index, whereby three types of adze were differentiated. Presumably, these types represent different functional tools. In the northwestern area the ratio of type 1 to type 2 is quite balanced, in the southeastern area type 1 occurs more frequently than type 2 (*Figs. 9, 10*, the illustrations only represent adze-blades whose dimensions were measurable). Even if those results are not statistically significant in terms of confidence intervals, they nevertheless support the trend already recognized.

Conclusion

The results of the study have shown that there are clear differences within the Linear Pottery Culture settlement of Erkelenz-Kückhoven on the intra-site level. The results were tested for significant differences and were statistically convincing (apart from the adzes, see previous section). The varying frequencies of tools can be interpreted as a focus on different activities and tasks within the settlement. Furthermore, each of the two parts of the site provided evidence for a different supply situation for raw materials and blank types; a possible explanation is that the inhabitants of both areas were members of different social groups with different access to raw materials and goods.

Unfortunately, the number of artefacts for the individual phases is too small for further chronological investigations. Interestingly, other settlements such as Vaihingen (Krause 1998; 2001) or Weisweiler

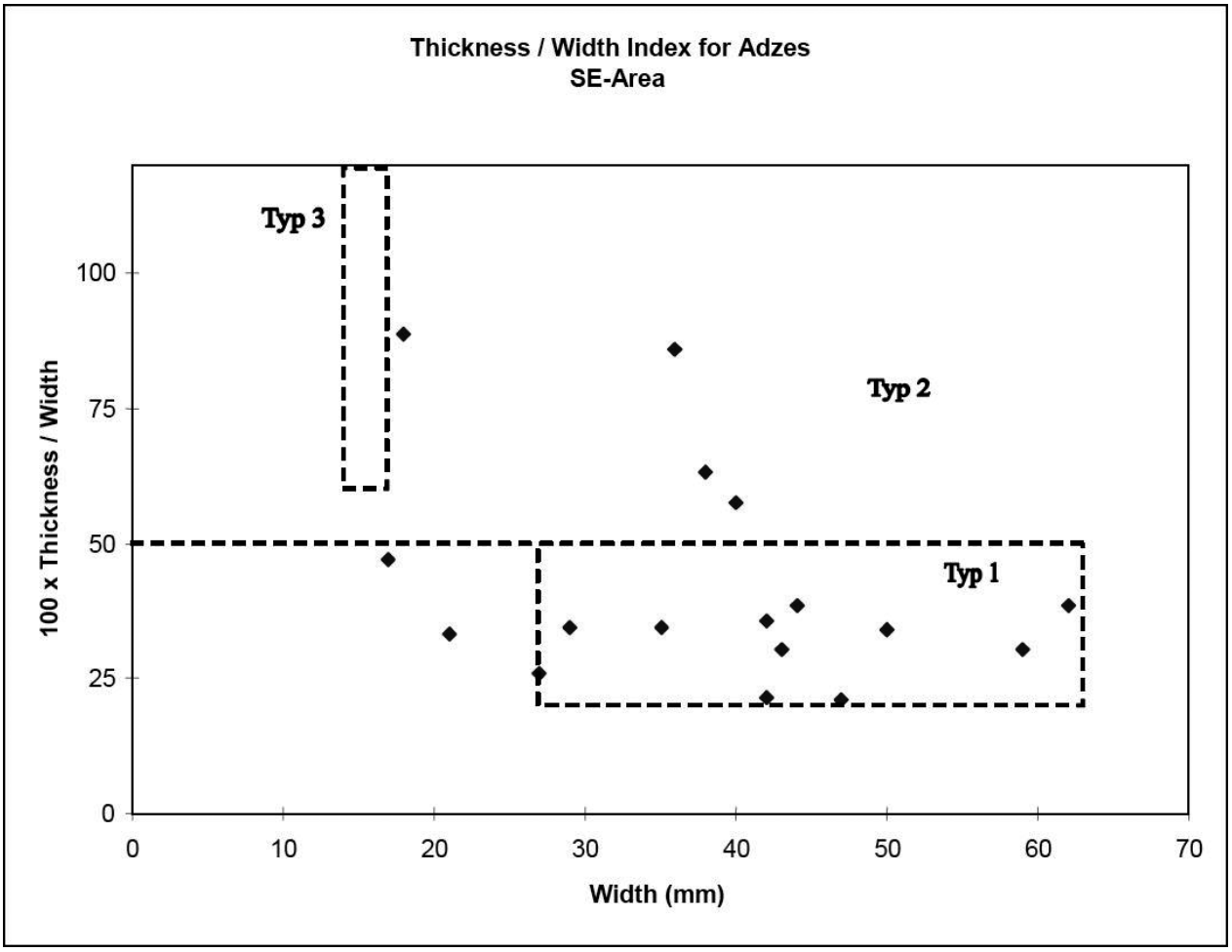

Fig. 10. Thickness / width index of adzes of the SE area.

107/110 (Nockemann 2007) show similar tendencies at the intra-site level. In Vaihingen a small-scale tradition becomes visible in the production of stone artefacts (Krause 1998, 31; Krause 2002, 36), and preliminary results for the settlement Weisweiler 107/110 point to differences in the supply of silex raw material (Nockemann 2007). At this latter settlement, which is also enclosed by a ditch, one farmstead, located outside of the ditch, was supplied with a different silex raw material than those located within the ditch enclosure.

The investigations on the intra-site level showed that the apparent uniformity of the settlements cannot always be confirmed.

Acknowledgements

I would like to thank Lee Clare (Cologne) for proof reading this text.

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